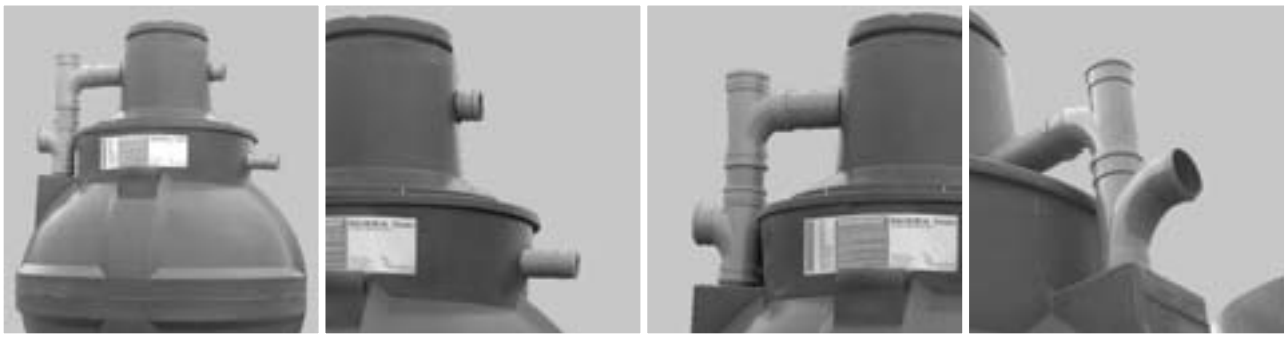
BALMORAL TANKS

Continuous Aeration Plant (CAP)

Installation instructions



Bord Agrément na hÉireann
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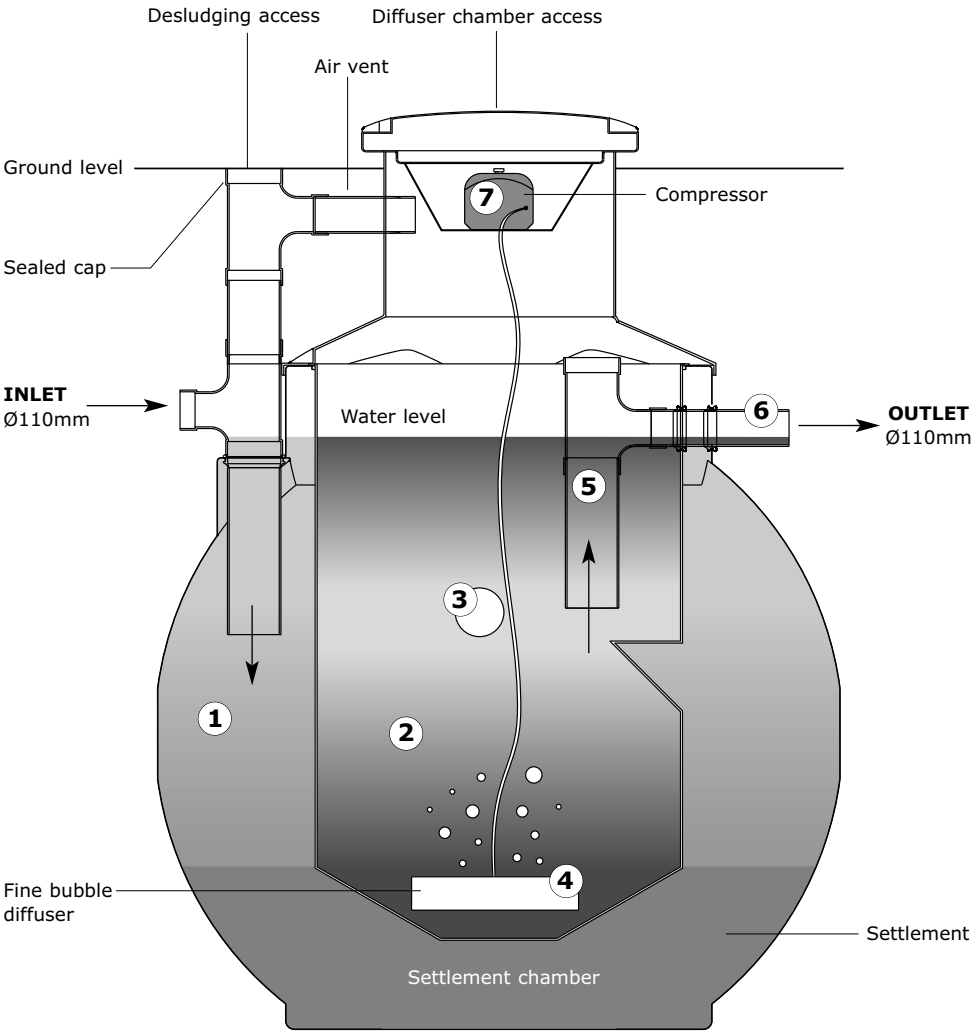
Figure 1 - CAP diagram
General layout - CAP 6 and CAP 12



1 Primary settlement tank
2 Reactor vessel
3 Transfer pipe
4 Fine bubble diffuser
5 Settling pipe
6 Outlet pipe
7 Air compressor

This product is subject to warranty terms and conditions as stated in Balmoral Tanks' sewage treatment plant warranty policy. If you require a copy of the sewage treatment plant warranty policy, please contact our After Sales Team on 01224 859000.

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Installation details

Storage before installation

Tanks should be set on a smooth level base and securely tied or propped to prevent overturning, damage or injury.

Handling and craneage during transport/installation

The tank should be handled by crane or other suitable equipment using the 50mm lifting eyes provided. Lift only when empty. Approximate weight of CAP 6 = 230kg. Approximate weight of CAP 12 = 330kg.

Superimposed loads/protected areas

No superimposed loads, such as vehicles, should be allowed within the protective area of the tank as shown in figure 2 and the table below.

Protected areas around tanks	
CAP	**Radius from centre of tank (m)**
BCAP6	3.5
BCAP12	4

The tank should not be situated close to a driveway or roadway, or anywhere there is a risk of it being subjected to additional superimposed loads. The protected area should also be fenced off. (See figure 2)

If vehicular or other superimposed loads are required to come within the protected area a concrete surround or reinforced concrete slab, designed by a qualified civil/structural engineer, must be in place so that no loads are transmitted directly onto the tank.

If a reinforced concrete slab is not provided for vehicle superimposed loads, this may result in the plant warranty being withdrawn.

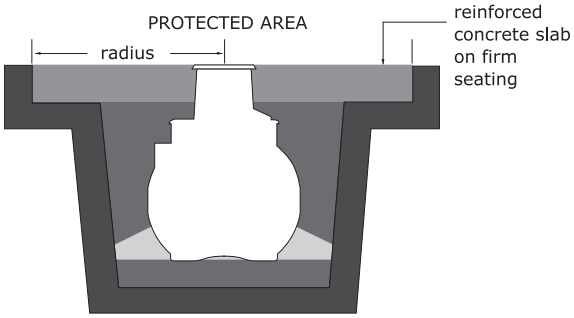


Figure 2
Protected areas

Site installation

"Dry" ground conditions

A site is deemed as being "dry" when at no time does ground water rise above the base of the tank.
Excavation should allow for a minimum of 150mm space all round and 150mm below the tank.

Where difficult ground conditions are encountered, ie, in unstable ground or shrinking clay, etc, an additional depth of 250mm should be excavated to allow for hardcore and sand blinding which provides a firm base for the concrete bed.

Installation procedure

- Place wet concrete (slump test 30mm, strength 25N/mm2) in base of excavation, grade and level to within 20mm. Lower tank carefully onto concrete and check tank is true and level.

- Fill tank to approximately 450mm water depth, place and consolidate additional concrete carefully under tank.
  Fill inner chamber with water until 50% full before filling outer chamber to the same level. This prevents excessive pressure on inner chamber.

- Continue to fill the tank with water whilst simultaneously backfilling around the tank with 12-15mm gravel in 150mm thick layers, ensuring the level of water in the tank is maintained at approximately 200mm higher than the level of backfill. This will maintain equal pressure inside and outside the tank

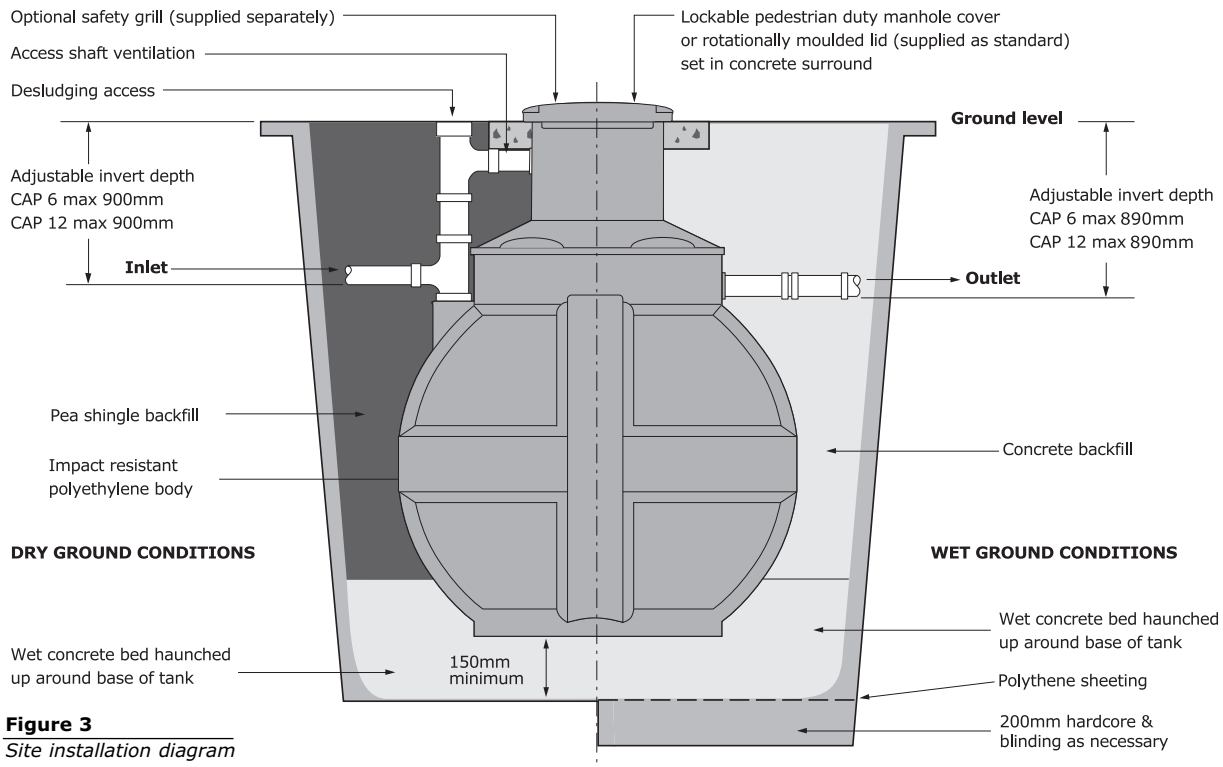


Figure 3
Site installation diagram

Note: Failure to adhere strictly to the written installation instructions will render any warranty null and void.
The diffuser is suspended within the tank for transit. The diffuser must be lowered into position on the base of the tank prior to use.

and will prevent flotation during installation. When the tank is full of water continue to cover the tank with a 200mm layer of gravel backfill.

- Finally, complete backfilling up to ground level with earth or reinforced ground slab as required.

Gravel specification

Backfill material must be:

- Pea gravel or crushed aggregate of uniform particle size 12-15mm.
- Chemically inert, washed clean and free of contaminants.

Site installation

"Wet" ground conditions

A site is deemed as "wet" when ground water rises above the base of the tank.

Excavation should allow for a minimum of 300mm space all round the tank and 150mm below the tank.

Where difficult ground conditions are encountered, ie, in unstable ground or shrinking clay, etc, additional excavation should take place, as deemed necessary by the supervising engineer, to allow for hardcore and sand blinding which provides a firm base for the concrete bed.

In poor soil conditions it is essential to make substantial provision for planking, strutting and temporary shuttering. Adequate pumps should be provided to keep the excavation free from ground water at all times during the course of the work. Provision should also be made for temporary covers and fencing around the excavation site to comply with statutory health & safety requirements.

Installation procedure

- Place wet concrete (slump test 30mm, strength 25N/mm2) in base of excavation, grade and level to within 20mm. Lower tank carefully onto concrete and check tank is true and level.

- Fill inner chamber with water until 50% full before filling outer chamber to the same level. This prevents excessive pressure on inner chamber. Place and consolidate additional concrete carefully under tank. Thereafter, haunch concrete up and around the bottom third of of tank circumference.
- Continue to fill the tank with water and carefully place concrete around the tank in 150mm thick layers, ensuring that there are no voids remaining around the tank, and that the level of water inside the tank is maintained at a level approximately 450mm higher than that of the concrete backfill.

- Do not use a vibrating poker.

- Continue to fill the tank with water until it reaches the height of the outlet pipe.

- The neck extension can only be surrounded in concrete after the concrete around the tank has hardened (approx 24 hrs).

  Continue to backfill up to ground level (or fit reinforced concrete slab) only after concrete around tank has been allowed to harden for 24 hours.

Manhole cover

The pedestrian duty manhole cover and frame are manufactured in tough polyethylene and fit directly onto the neck of the tank. The tank neck can be cut on site and adjusted.

Ventilation

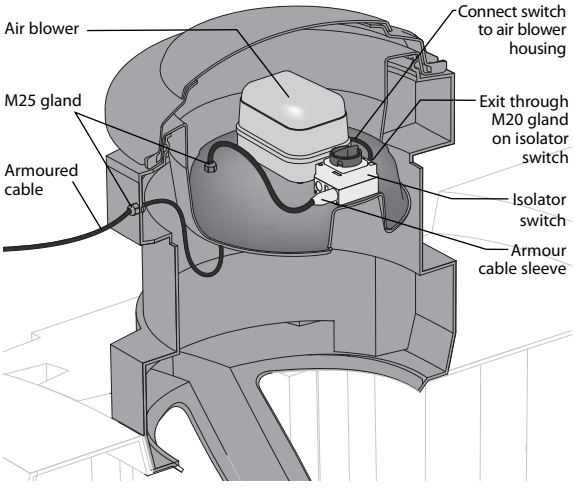
A 110mm dia uPVC pipe connection is fitted in the access shaft to allow ventilation of the tank through the soil stack on the source building. This stack must extend to the upper most ridge of the building and must not terminate at eve height. Flush fitting tile vents are not recommended.

Electrical power requirements

Power requirement is single phase 240V, through a 3-core steel wired armoured (SWA) cable. Refer to the product drawings supplied with your unit for location of the air blower housing unit and specific power ratings to size the electrical cable.

Remove the air blower housing from the turret and feed the SWA cable into the tank through the gland connection in the turret. Pull through sufficient slack, approx 750mm, into the tank and route the cable through the base of the air blower housing via the gland connection. Cable slack is required to facilitate removal of the lid.

Figure 4
Inside the air blower turret



Inside the air blower housing

Remove the four screws securing the top of the air blower housing to access the internals. The SWA supply should be wired into the supplied rotary switch using the gland package supplied. Remove the plug on the end of the air blower cable (if fitted) and wire into the output side of the rotary switch using the gland provided. Secure the switch to the air blower housing, positioning it next to the air blower using two screws and close the switch housing.

The incoming power supply to the tank must be installed with a separate isolation switch and earth leakage circuit breaker in the source building. Ensure the SWA cable is correctly installed earthing the outer steel armouring at both ends.

Finally, complete backfilling up to ground level with earth or reinforced ground slab as required.

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TNK-CAPINST-0610-Rev A